Amendments to the Claims

Claims 1-9 and 18-20 and 26 are provisionally withdrawn with traverse. Claims 10-17, 21-25 and 27-33 are elected. Claim 21, 27, 28, 33 are cancelled and Claims 34, 35, 36, 37 are added. Therefore the number of Claims is unchanged in this Amendment.

Claims 1-9 are provisionally withdrawn:

1. [Withdrawn] A composition comprising a first compound including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine group and a second compound containing a non-shielded purine or pyrimidine group bound to a portion of the metal atoms and/or ions.

2. [Withdrawn] The composition of claim 1, wherein the second compound is selected from the group of RNA, single stranded DNA, and other molecules having a non-shielded purine and/or pyrimidine moiety or group.

3. [Withdrawn] An immobilized metal affinity chromatography (IMAC) column comprising a packing including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine moiety or group and a compound containing a non-shielded purine or pyrimidine moiety or group bound to a portion of the metal atoms and/or ions.

4. [Withdrawn] A substrate comprising a plurality of ligands bonded thereto, each ligand immobilizing a metal atom and/or ion capable of binding compounds containing a non-shielded purine or pyrimidine moiety or group, and a compound containing a non-shielded purine or pyrimidine moiety or group bound to a portion of the metal atoms and/or ions.

5. [Withdrawn] The substrate of claim 4, wherein the second compound is selected from the group of RNA, single stranded DNA, and other molecules having a non-shielded purine and/or pyrimidine moiety or group.

6. [Withdrawn] An apparatus comprising a sample input unit, a separation unit, a detector unit and an analyzer unit.

7. [Withdrawn] The apparatus of claim 6, wherein the separation unit is a zone comprising an IMAC matrix including metal atoms, metal ions or mixtures thereof capable of binding compound having a non-shielded purine moiety, pyrimidine moiety or mixture thereof.

8. [Withdrawn] An apparatus comprising a substrate having an IMAC ligand coated thereon, bonded thereto, deposited thereon or deposited therein, where the substrate is adapted to remove contaminating compounds including a non-shielded purine moiety, pyrimidine moiety, or mixture thereof from target compounds including a shielded purine moiety, pyrimidine moiety, or mixture thereof.

9. [Withdrawn] The apparatus of claim 8, wherein the substrate is selected from the group consisting of a porous stirrer, a filter, a membrane, an interior wall of a vessel, or mixtures thereof.

Original Claims 10-17 are elected:

10. [Amended] A method for separating compounds comprising the step of:

contacting a solution comprising compounds including DNA and/or RNA, which comprise a non-shielded purine or pyrimidine moiety, and compounds including a shielded purine or pyrimidine moiety with a solid composition including immobilized metal ~~atoms and/or~~ ions capable of binding compounds containing a non-shielded purine or pyrimidine moiety

to form a supernatant liquid having DNA and/or RNA, and a reduced amount of compounds including a non-shielded purine or pyrimidine moiety.

11. [Original] The method of claim 10, further comprising the step of:

separating the supernatant liquid from the solid composition.

12. [Amended] A method for separating compounds comprising the steps of:

passing a solution comprising a mixture of compounds including DNA and/or RNA, comprising ~~and~~ a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof through a column including an IMAC ligand, where the ligand is capable of differentially binding the compounds; and

collecting purified samples of DNA and/or RNA~~, each compound~~.

13. [Original] The method of claim 12, further comprising the step of:

detecting each compound in an effluent from the column as a function of time from at least one detectable property associated with each compound; and

determining the identity of each compound from the detected properties.

14. [Original] A method for purifying food stuffs containing purine and/or pyrimidine moieties comprising the steps of:

forming a crude food stuff comprising cellular constituents including digestable proteins and nucleic acid contaminants including a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof;

contacting the food stuff with substrate comprising an IMAC ligand, where the substrate binds the nucleic acid contaminants; and

removing the substrate comprising the IMAC ligand having bound thereto the nucleic acid contaminants to form a purified food stuff.

15. [Original] The method of claim 14, further comprising the step of

treating the crude food stuff with a DNAse, endo or exo nuclease or other nucleic acid digestion enzyme or agent prior to the contacting step.

16. [Amended] A method for purifying a crude DNA and/or RNA compound containing a non-shielded purine and/or pyrimidine moiety comprising the steps of:

forming a crude mixture comprising a target compound and contaminants;

contacting the crude mixture with an agent including an IMAC ligand capable of binding to the target compound to form an IMAC ligand complex;

separating the complex from the contaminants; and

recovering the compound from the complex.

17. [Amended] The method of claim 16, wherein the compound is an AIDs drug ~~drugs~~ selected from the group consisting of AZT or DDI, ~~co-enzyme A,~~ or mixtures thereof.

Claims 18-20 are provisionally withdrawn:

18. [Withdrawn] An assay comprising the steps of:

contacting a microplate substrate comprising wells coated with a composition comprising a IMAC-oligonucleotide complex including an IMAC ligand and a single stranded oligonucleotide having a first molecular and/or atomic tag bound to the IMAC ligand; and

contacting a nucleic acid sequence including a second molecular and/or atomic tag with the IMAC-oligonucleotide complex; and

measuring a change in fluorescence when the nucleic acid sequence includes a complimentary subsequence to oligonucleotide due to an interaction between the first and second molecular and/or atomic tags.

19. [Withdrawn] The assay of claim 18, wherein the first tag is a fluorophore and the second tag is a quencher for the fluorophore.

20. [Withdrawn] An assay comprising the steps of contacting a substrate comprising a surface coated with a composition comprising an IMAC ligand and a first fluorophore with an oligonucleotide including a second fluorophore and measuring an effective Stoke shift such that a large effective Stoke shift signifies oligonucleotide binding to the coated substrate and a normal effective Stoke shift signifies no oligonucleotide binding to the coated substrate.

Claims 21 – 33 were added in Applicants response to the Restriction Requirement:

Please Cancel Claims 21, 27, 28, 33 so they may be replaced by non-duplicatory new claims 34, 35, 36, 37.

21. [Cancelled] A method for separating compounds comprising the step of:

contacting a solution comprising ~~compounds including~~ DNA and/or RNA, and containing a non-shielded purine or pyrimidine moiety containing compounds including a shielded purine or pyrimidine moiety with a solid composition including immobilized metal ~~atoms and/or~~ ions capable of binding compounds to form a supernatant liquid having DNA and/or RNA, and a reduced amount of compounds including a non-shielded purine or pyrimidine moiety.[;]

22. [New] A method according to Claim 21 further comprising the steps of:

separating the supernatant liquid from the solid composition; or

further comprising the steps of:

separating the supernatant liquid from the solid composition and

eluting the compounds including a non-shielded purine or pyrimidine moiety from the solid composition.

23. Amended] A method for separating compounds comprising the step of:

contacting a solution comprising compounds including DNA and/or RNA, and a non-shielded purine or pyrimidine moiety and compounds including a shielded purine or pyrimidine moiety with a solid composition including immobilized metal atoms and/or ions capable of binding compounds containing a non-shielded purine or pyrimidine moiety to form a supernatant liquid having a reduced amount of compounds including a non-shielded purine or pyrimidine moiety; [.]

wherein the compounds including a non-shielded purine or pyrimidine moiety comprise a nucleoside, a nucleotide, a single stranded nucleic acid oligomer, or a single stranded nucleic aid polymer and the compounds including a shielded purine or pyrimidine moiety comprise double stranded nucleic acid oligomers or double stranded nucleic acid polymers; or wherein the supernatant liquid comprises compounds including DNA and/or RNA, and ~~a shielded purine or pyrimidine moiety~~ having less than or equal to 5% by weight compounds including a non-shielded purine or pyrimidine moiety.

24. [Amended] A method of Claim 22 wherein the supernatant liquid comprises compounds including a shielded purine or pyrimidine moiety

having less than or equal to 1% by weight compounds including a non-shielded purine or pyrimidine moiety.[;]

25. [New] A method of Claim 22 wherein the supernatant liquid comprises compounds including a shielded purine or pyrimidine moiety having less than or equal to 0.01% by weight compounds including a non-shielded purine or pyrimidine moiety.

26. [Withdrawn] A method for making multisubstrate columns comprising the step of running a small amount of IMAC ligand onto an activated column and then flooding the rest of the column with at least one additional ligand or stationary phase.

27. [Cancelled] A method for separating compounds comprising the steps of:

passing a solution comprising a mixture of compounds including a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof through a column including an IMAC ligand, where the ligand is capable of differentially binding the compounds; and

collecting purified samples of each compound.[;] +

28. [Cancelled] A method of Claim 27 ~~10~~ further comprising the step of:
detecting each compound in an effluent from the column as a function of time from at least one detectable property associated with each compound; and

determining the identity of each compound from the detected properties.

29. [Amended] A method of Claim 27 ~~26~~ wherein the mixture of compounds comprises poly(A) tailed mRNA sequences and other mRNA sequences from eukaryotic cells, where the poly(a) mRNA sequences elute after the other mRNA sequences; or wherein the mixture for compounds comprises denatured nucleic acid sequences, where sequences having A rich

regions elute after sequences having T rich regions so that complementary strands can be resolved.

30. [Amended] A method of Claim 27 wherein the mixture for compounds comprises denatured nucleic acid sequences, where sequences having C rich regions elute after sequences having G rich regions so that complementary strands can be resolved; or wherein the mixture of compounds comprises denatured nucleic acid sequences having A-C, A-G, A-C-G, T-G, T-C and or T-G-C rich regions so that the sequences having the ~~thee~~ A-C, A-G, and/or A-C-G rich regions elute after their complementary sequences having T-G, T-C and or T-G-C rich regions resulting in a resolution of complementary sequences.

31 . [Previously Submitted] A method for purifying food stuffs containing purine and/or pyrimidine moieties comprising the steps of:

forming a crude food stuff comprising cellular constituents including digestable proteins and nucleic acid contaminants including a non-shielded purine moiety, a non-shielded pyrimidine moiety or mixture thereof;

contacting the food stuff with substrate comprising an IMAC ligand, where the substrate binds the nucleic acid contaminants; and

removing the substrate comprising the IMAC ligand having bound thereto the nucleic acid contaminants to form a purified food stuff; and optionally further comprising the step of treating the crude food stuff with a DNAse, endo or exo nuclease or other nucleic acid digestion enzyme or agent prior to the contacting step.

32 [Amended] A method for purifying a crude compound containing a non-shielded purine and/or pyrimidine moiety from a mixture containing DNA and/or RNA, which comprise compounds with and without a non-shielded purine and/or pyrimidine moiety, comprising the steps of:

forming a crude mixture comprising a target compound and contaminants;

contacting the crude mixture with an agent including an IMAC ligand capable of binding to the target compound to form an IMAC ligand complex;

separating the complex from the contaminants; and

recovering the compound from the complex.

Please Cancel Claim 33 as being a duplicate of Claim 17:

33. [Cancelled] A method of Claim 32 wherein the compound is an AIDs drug selected from the group consisting of AZT or DDI, ~~co-enzyme A,~~ and ~~or~~ mixtures thereof.

34. [New] The method of claim 10 wherein the molecule containing a non-shielded purine or pyrimidine moiety is selected from among single-stranded DNA, partially single-stranded DNA, denatured DNA, fragmented DNA or RNA, plasmid DNA containing single-stranded regions, incomplete or imperfect PCR products, chain-terminated polymerase products, restriction endonuclease-digested DNA, single-stranded PNA, single-stranded primer, single stranded RNA, polyA mRNA and/or messenger RNA, and is removed from compounds that do not contain a non-shielded purine or pyrimidine moiety or group such as genomic DNA, double-stranded plasmid DNA, double-stranded PCR product, double-stranded hybrid, or double-stranded PNA.

Add new Claims 35-37:

35. [New] A method for separating compounds comprising the step of:

contacting a solution comprising double-stranded DNA and additionally comprising RNA and/or DNA, the RNA and/or DNA containing single-stranded portions having a non-shielded purine or pyrimidine moiety, with a solid composition including immobilized metal ions capable of binding compounds having a non-shielded purine or pyrimidine moiety, to form a supernatant liquid having a reduced amount of RNA and/or DNA having single-stranded portions.

36. [New] A method for separating compounds comprising the steps of:

passing a solution comprising comprising RNA and/or DNA, the RNA and/or DNA containing single-stranded portions having a non-shielded purine or pyrimidine moiety through a column including an IMAC ligand, where the ligand is capable of differentially binding the compounds; and

collecting purified samples of each compound.

37. [New] The method of claim 36, further comprising the step of:

detecting each compound in an effluent from the column as a function of time from at least one detectable property associated with each compound; and

determining the identity of each compound from the detected properties.